

gaseous mixture with an adsorbent which preferentially adsorbs the alkene, at a selected temperature and pressure, thereby producing a non-adsorbed component and an alkene-rich adsorbed component; the adsorbent comprising a carrier having a surface area, the carrier having been impregnated with a silver compound by incipient wetness, thereby resulting in a monolayer of the silver compound dispersed on substantially the entire surface area, the silver compound releasably retaining the alkene; and the carrier comprising a plurality of pores having a pore size greater than the effective molecular diameter of the alkene; and changing at least one of the pressure and temperature to thereby release the alkene-rich component from the adsorbent. The adsorbent advantageously and unexpectedly substantially maintains its adsorbent capacity and preference for the alkene in the presence of ~~the sulfur compound~~ hydrogen sulfide.

**For the paragraph at page 6, lines 3-19, please revise as follows:**

Further novel, sulfur resistant and/or tolerant adsorbents are useful in a method for separating a diene from a mixture including the diene and ~~a sulfur compound~~ hydrogen sulfide, the hydrogen sulfide present in amounts normally present in conventional cracked gas streams. The process comprises the step of contacting the mixture with an adsorbent which preferentially adsorbs the diene, at a selected temperature and pressure, thereby producing a non-adsorbed component and a diene-rich adsorbed component, wherein the adsorbent comprises an ion-exchanged zeolite selected from the group consisting of zeolite X, zeolite Y, zeolite LSX, and mixtures thereof, the zeolite having exchangeable cationic sites, and a majority of the sites having silver cation or copper cation present, and wherein the preferential adsorption occurs by  $\pi$ -complexation, and further wherein the adsorbent advantageously and unexpectedly substantially maintains its adsorbent capacity and preference for the diene in the presence of the ~~sulfur compound~~ hydrogen sulfide.

**For the paragraph at page 7, lines 7-8, please revise as follows:**

Figs. 10a and 10b are graphs showing isotherms of 1,3-butadiene and 1-butene at 120 °C before and after H<sub>2</sub>S exposure;

**For the paragraph at page 9, lines 18-20, please revise as follows:**

In one exemplary embodiment ~~of this embodiment~~ of the present invention, the silver compound is silver nitrate (AgNO<sub>3</sub>) and the carrier is silica (SiO<sub>2</sub>).

**For the paragraph at page 12, lines 16-19, please revise as follows:**

This adsorbent also fortuitously and unexpectedly substantially maintains its adsorbent capacity and preference for the diene in the presence of the sulfur compound, for example, hydrogen sulfide.

**For the paragraph at page 13, lines 12-22, please revise as follows:**

As demonstrated below, the sulfur compound is generally hydrogen sulfide. The novel adsorbents were exposed to very severe amounts; of hydrogen sulfide; for example the hydrogen sulfide was present in amounts up to about 66 mole%. In sharp contrast, a conventional cracked gas stream before any desulfurizing distillation steps contains hydrogen sulfide present in amounts of about 0.01 mole%. As such, the data presented hereinbelow indicate that the novel adsorbents of the present invention would be quite robust, i.e. i.e. very tolerant and/or resistant to  $H_2S$  under normal operating conditions.

**For the paragraph at page 17, lines 13-30, please revise as follows:**

In conclusion, as stated above,  $H_2S$  is always present to some extent in cracked gas streams. It is typically removed with conventional technology prior to the olefin-paraffin separation step. In the case of  $Ag^+$ -based systems (eg. the classical, aqueous  $AgNO_3$  adsorption systems), the presence of  $H_2S$  leads to loss of silver ions through the formation of silver sulfide,  $Ag_2S$ . ~~The~~ This reaction between  $H_2S$  and  $Ag^+$  ions in water is known to occur very readily. The  $Ag_2S$  formed is a finely-divided precipitate that is highly insoluble in water. The room temperature solubility of  $AgNO_3$  in water is 216 g/L, while that of  $Ag_2S$  is  $1.4 \times 10^{-4}$  g/L. Therefore, for ~~For~~ solid adsorbents containing monodispersed or ion-exchanged  $Ag^+$ , one would expect a similar sulfide-forming reaction to occur with  $H_2S$ . That is, some or all of the  $Ag^+$  will likely "come off" of the adsorbent as  $Ag_2S$  particles. The effectiveness of the adsorbent for olefins should therefore be greatly reduced.